CLAIMS

1. A memory device for multi-level recording comprising:

a substrate; and

a memory material supported by the substrate, the memory material including a phase change alloy defined by: $In_x (Sb_nTe_{100-n})_{100-x}$ where x is 3-30, n is 63-82.

2. The device of claim 1, wherein x is 5-15.

3. The device of claim 1, wherein x is 7-15.

4. The device of claim 1, wherein x is 9-13.

5 The device of claim 1, wherein the phase change alloy is $In_9(Sb_{72}Te_{28})_{91}$.

6. The device of claim 1, wherein the phase change alloy is $In_{10}(Sb_{72}Te_{28})_{90}$.

7. The device of claim 1, wherein the phase change alloy is $In_{11}(Sb_{72}Te_{28})_{89}$.

8. The device of claim 1, wherein the phase change alloy has a peak with a substantial FWHM at around 2 theta =24-26 degrees of X-ray diffraction using CuKα.

9. An optical memory device for multi-level recording comprising:

a substrate; and

a phase change alloy supported on the substrate, the phase change alloy lacking silver and having a eutectic base alloy composition with at least one element for providing a sigma-to-dynamic range of less than 2%.

10. The device of claim 9, wherein the phase change alloy has a peak with a substantial FWHM at around 2 theta =24-26 degrees of X-ray diffraction using CuKα.

11. The device of claim 9, wherein the alloy has at least two phases during data recording, one phase being a major phase and the other phase being a minor phase.

12. The device of claim 10, wherein the device is an optical memory disk.

13. The device of claim 10, wherein the alloy has 7 or more detectable levels.

14. The device of claim 10, wherein the alloy has at least 11 detectable levels.

15. The device of claim 11, wherein the memory material comprises a phase change alloy defined by: $M_x (Sb_nTe_{100-n})_{100-x}$ where x is 3-30, n is 63-82, where M is at least one main group metal.

16. The device of claim 15, wherein x is 5-15.

17. The device of claim 15, wherein x is 7-15.

18. The device of claim 15, wherein x is 9-13.

19. The device of claim 11, wherein the FWHM at around 2 theta =24-26 degrees of X-ray diffraction using CuKα is greater than that of AgIn(SbTe) at a corresponding concentration for M.